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Executive Summary

This document represents the FMD Risk Assessment for animals and animal products conducted by the Animal and Plant Health Inspection Service (APHIS) Agency of the United States Department of Agriculture (USDA) and details threats of foot-and-mouth disease (FMD) to the United States from animals and animal products originating from European Union (EU) Member States (MS) and the United Kingdom (UK) and countries located in the rest of the world. This document is the first in a series of documents intended to provide information to the United States regarding the risk of FMD to the United States.

FMD Risk Assessment for the Export of Animals and Animal Products from France and Ireland to the United States

August 2001
(Draft)

This document, which is associated with the risk associated with export of animal and animal products from Austria, Belgium, Denmark, Ireland, France, Germany, Poland, Italy, Luxembourg, The Netherlands, Portugal, Spain, and Sweden (PS).

In a previous document, APHIS identified the Three Member States (i.e., France, Ireland, and the rest of the EU) which exports had been selected into a "Tiered-risk category." The Two Member States (i.e., France and Ireland) that were selected were categorized as "A." In the present document, the risk associated with the export of animal and animal products from the EU countries is categorized as "B" and "C" based on the risk associated with the movement of the FMD virus from the EU countries to the United States.

Animal and Plant Health Inspection Service Veterinary Services

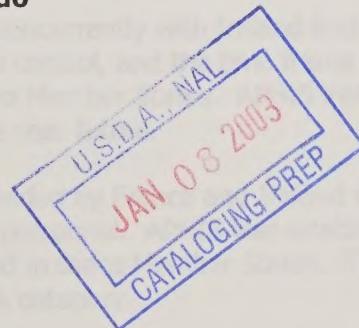
Animal and Plant Health Inspection Service (APHIS) is the lead agency for the FMD risk assessment of France, Ireland, and The Netherlands. APHIS has been specifically funded to facilitate this risk assessment.

National Center for Import and Export Riverdale, Maryland and

Centers for Epidemiology and Animal Health Fort Collins, Colorado

APHIS and FMD are the states of The United States and the European Union. The European Union has been identified as a "Tiered-risk category" and the United States has been identified as a "Tiered-risk category." The United States of America has been identified as a "Tiered-risk category."

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This descriptive assessment is a supplement to a previous risk assessment conducted by the Animal and Plant Health Inspection Service (APHIS) [1] on the risk of importing foot-and-mouth disease (FMD) into the United States from animals and animal products originating from European Union Member States. APHIS initially considered animals and products from all Member States to pose a potential risk because of the open border policy that had existed prior to the FMD outbreaks in France, Ireland, and The Netherlands.

For that reason, APHIS issued an administrative ban on all animals and products from the thirteen Member States that continued to be identified as FMD-free in APHIS legislation after the United Kingdom (UK) was removed from the list of FMD-free regions, even though FMD outbreaks had been detected only in France, Ireland, and The Netherlands [2]. In the initial assessment, APHIS evaluated the risk associated with export of animals and animal products from Austria, Belgium, Denmark, Finland, France, Germany, Ireland, Italy, Luxembourg, The Netherlands, Portugal, Spain, and Sweden [1].

In a descriptive evaluation, APHIS classified the three Member States (i.e., France, Ireland, and the Netherlands) in which outbreaks had been detected into a "higher" risk category. The Ten Member States, in which no outbreaks had been detected, were classified as "lower" risk. In the interim rule published to enforce the administrative ban [3], APHIS allowed trade to resume with the Member States in the "lower" risk category and allowed them to remain on the FMD-free list. It removed only France, Ireland, and the Netherlands from the list of countries considered FMD-free. In the interim rule, APHIS agreed to re-evaluate the FMD status of France, Ireland, and The Netherlands using a legislative process intended to facilitate the recognition process.

In this review, APHIS presents its re-evaluation of the FMD situation in Ireland and France. This re-evaluation was conducted on the basis of documentation from the Member States that disease had been eradicated for a period of time that was consistent with OIE recommendations for a disease-free period (i.e., 90 days after the destruction of the last case or of the last vaccinated animal where vaccination is practiced).

APHIS did not re-evaluate the status of The Netherlands concurrently with Ireland and France. The Netherlands had used vaccination as a tool in disease control, and the time frame for meeting OIE criteria began later than that of the other two Member States. APHIS intends to re-evaluate The Netherlands at its appropriate time in the near future.

APHIS based its current evaluation on additional data provided by France and Ireland regarding their disease eradication efforts and a site visit by APHIS personnel. APHIS was unable to identify risk factors remaining after disease was eradicated in these Member States. Therefore, APHIS reassigned these Member States to the "lower" risk category.

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Introduction

On February 19, 2001, FMD was detected in the UK. Disease subsequently spread throughout the UK, and was confirmed in France (March 12, 2001), Ireland (March 20, 2001), and The Netherlands (March 21, 2001) [4].

Following the outbreak in the UK, APHIS issued an administrative ban on importation of animals and animal products from the UK. APHIS ultimately reinforced this ban with an interim rule, essentially putting the ban into its regulations [5].

In response to the outbreaks in the three additional Member States, APHIS issued an administrative ban on imports from the thirteen remaining European Union (EU) Member States that APHIS had previously recognized as free of FMD [2]. This action did not affect Greece since Greece was not considered free at the time the ban was implemented.

However, before implementing an interim rule removing all thirteen of the States, APHIS conducted a descriptive assessment of the risk of exporting animals and animal products at the level of the European Community (EC) and from individual Member States [1].

Although it recognized the risks involved with factors such as swill feeding and the significance of high virus availability, APHIS identified the detection of outbreaks in an individual Member State as the factor contributing most to the risk of exporting infected animals or products. Associated with this risk was the observation that none of the affected Member States met the waiting period requirement prescribed by the Office International des Epizooties (OIE) for recognizing a region as free from FMD [6]. Rather, EC legislation allowed restrictions to be lifted 30 days after the last case of disease had been eliminated [7].

In its assessment, APHIS classified each of the thirteen Member States into two general categories, one of "higher" risk and one of "lower risk." Primarily because of the outbreaks, France, Ireland, and The Netherlands were assigned to the "higher" risk category. The ten remaining Member States were assigned to the "lower" risk category.

APHIS then enforced its administrative ban by publishing an interim rule removing France, Ireland, and the Netherlands from the list of countries recognized as free from FMD [3]. APHIS allowed trade with Austria, Belgium, Denmark, Finland, Germany, Italy, Luxembourg, Portugal, Spain, and Sweden to resume. In its risk assessment, APHIS indicated that it might re-evaluate the Member States impacted once they had met OIE criteria for freedom from FMD.

Subsequently, France and Ireland provided information suggesting that FMD had been eradicated and that they had met the OIE criterion for a disease-free period after eradication. Because The Netherlands included vaccination in its eradication program, this Member State was unable to meet the OIE criterion as early as France and Ireland. Therefore, The Netherlands was not included in this assessment. Its status will be assessed at a later date, once it fulfills the 90-day period after destruction of all vaccinated animals.

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Objective

The objective of this review is to assess the level of risk associated with the resumption of trade in susceptible animals and animal products with France and Ireland as a follow-up to the previous assessment of risk [1]. The assessment will provide the APHIS basis for evaluating the risk of recognizing France and Ireland as free from FMD and reinstating these Member States on the list of regions that APHIS considers to be FMD-free.

APHIS Approach to Regionalization

France and Ireland provided information to APHIS regarding the status of their FMD eradication efforts. In addition, a team of APHIS personnel conducted a site visit to validate the information provided by France and Ireland and to evaluate the FMD status in these Member States. The team's reports [8, 9], published literature, EU legislation [7], documents provided by the EC, and reports to the OIE [4] constitute the supporting documentation for this assessment.

Risk Assessment Format

This document represents a supplement to the previous assessment. As such, it relies on that discussion for details of the scope of the evaluation, information requested from the thirteen Member States for the initial assessment, a summary of EC legislation, and a statement of the OIE recommendations on waiting periods to re-establish disease-free status in regions that have experienced FMD outbreaks.

To reiterate, however, for completeness, the primary OIE criterion applicable to this assessment is the criterion indicating that, when FMD occurs in an FMD-free country or zone where vaccination is not practiced, 3 months must lapse after the last case has been destroyed where stamping-out and serological surveillance are applied [6].

Information of FMD in France and Ireland

France [8, 10-17]

[Figure 1]

Outbreak summary

February 21	The first outbreak of FMD was confirmed in the UK. France reactivated its 1991 contingency plan, which required cooperation between national and departmental officials.
In the days following the UK outbreak	French veterinary officials <ul style="list-style-type: none">• placed an embargo on all susceptible livestock and high-risk products derived from such livestock;• traced animal movements using the ANIMO system, identified premises holding "high-risk" livestock, quarantined the premises and clinically examined and culled all ovine livestock originating from the UK and all susceptible species in physical contact with such livestock;• took similar actions after outbreaks were reported in the Netherlands and Ireland;• sampled and tested 10% of culled animals from each consignment that had arrived from affected Member States at a minimum of 30

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	<p>animals per batch of livestock and similarly sampled and tested contact animals;</p> <ul style="list-style-type: none"> established protection zones lasting for 30 days around premises containing animals with positive results; quarantined non-susceptible species for 7 days; and banned movement within France as well as into and out of the Member State of susceptible species and horses.
February 28	FMD was confirmed in Meigh, Northern Ireland.
March 13	FMD was confirmed in Mayenne, France
March 21	FMD was confirmed in The Netherlands.
March 22	FMD was confirmed in Ireland.

Sequence of events in first French outbreak (Mayenne province)

February 16	ANIMO data indicated that infected British sheep arrived.
February 22	Traceback was initiated to identify sheep transported from the UK to France.
February 23	A Mayenne premises receiving sheep from the UK was identified and quarantined.
February 26	Further traceback identified some animals on the Mayenne premises as originating from the UK premises on which outbreak #11 was confirmed. Slaughter was initiated, and blood samples were collected from 50 culled animals.
February 27	Although clinical signs were not observed, sheep on the Mayenne premises were slaughtered as required on all premises holding "high risk" livestock; control (3 km) and surveillance (10 km) zones were established around the premises; movement of animals from the premises was investigated; and surveillance was undertaken for clinical signs in susceptible species.
March 5	Laboratory tests were completed on samples from sheep from the Mayenne premises. Serum neutralization test results were positive in 19/50 cases.
March 6	Cleaning and disinfection of this farm was completed.
March 12	Clinical signs were observed in 6 dairy cattle located 500 meters distant from sheep (in farm across the road within restriction zone); samples were taken for testing; susceptible species (114 cattle) on premises were slaughtered; protection and surveillance zones were re-defined for new premises; census was taken in the zone; epidemiological surveys (clinical and serological monitoring) were initiated; and local authorities were involved
March 13	Disease was confirmed in cattle and reported to the OIE; remaining cattle on premises were slaughtered; a crisis team was activated; police blocked 13 roads into the surveillance zone; and livestock movements were prohibited.
March 14	Animals on two swine farms (3,053 animals) were culled and destroyed. These farms were located within the 500 meter area of potential airborne spread defined using a model for airborne transmission of 10 virus particles [16]. This model was developed from swine studies, taking the maximum potential concentration of virus for the particular situation. Swine (58 animals) that had been moved to other farms from the premises were also destroyed.
March 23	Cleaning and disinfection of Mayenne premises was completed.
April 1-20	Samples for surveillance testing were collected in both surveillance and control zones.
April 23	Controls were lifted from all zones.

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Sequence of events in the second French outbreak (Seine-et-Marne)

February 26	Sheep originating from Ireland that had been in contact with animals on the outbreak premises in Mayenne were transported to a farm in Seine-et-Marne. This movement was not recognized at the time it occurred but was established by subsequent epidemiological investigation.
March 1	The movement pathway of animals was identified. The suspect premises was quarantined. Measures were taken similar to those in Mayenne.
March 5	Samples were taken from sheep.
March 6	The animals were slaughtered. Additional samples were taken for serology. Test results revealed some positive serology later. These results were obtained after the animals were slaughtered.
March 8	Animal movement was prohibited in the control zone.
March 23	The second outbreak (last case in Member State) was suspected based on clinical signs observed by the owner in a calf. The owner reported the signs at 2 pm. Disease was confirmed the same day, within 9 hours of signs being reported. Cattle, sheep and swine (119, 147, and 10, respectively) on the premises were culled immediately. Control and surveillance zones were established. Ten swine and 215 sheep in the surveillance zone as well as 1,050 sheep linked by contact were slaughtered. The remaining animals in the zones were subjected to intensive clinical observations and serological tests.
March 24	Restrictions were placed on all trade and movement of products from animals at risk.
May 5/6	Controls were lifted on all zones.

Comments

Level of preparation

Because of the outbreak in the UK, France was able to make preparations that were helpful in dealing with the outbreaks. Diagnosis of disease was not as much of a surprise as it might have been.

At the time of the outbreaks, contingency plans were already in place in each department. These plans define actions to be taken by veterinary services, police, and fire-fighting personnel in the event of an outbreak. The plans also identify the roles and responsibilities of individual units participating in control and surveillance of the outbreaks, both at the local level and at the Federal level. These were required by EC legislation [7]. Contingency plans in France focus on 10 questions:

- What action is taken when there is suspicion?
- What are the epidemiological aspects of the situation (as defined by a standardized questionnaire)?
- What actions are taken upon confirmation of disease?
- What approach is taken to slaughter?
- What are the burial procedures?
- What are the disinfection procedures?
- How are protection and surveillance areas established?
- What is done with products originating in these areas?
- Will emergency vaccination be conducted and, if so, how?
- What actions are taken in artificial insemination centers?

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Lessons learned during the outbreak will be discussed with Chief Veterinary Officers of other Member States and will be written into existing contingency plans, increasing preparedness for the future.

Traceback

Animals imported from the UK to France after January 15, 2001, were traced through the ANIMO system. Traceback identified premises that had received sheep originating from the UK between mid-January and February 21, 2001.

The traceback showed that some animals originating from the premises on which the eleventh outbreak in the UK was diagnosed were sent to France. The time frame was relatively advantageous for French preparedness in that, by the time the eleventh outbreak was diagnosed, all of the imported animals had been destroyed. In fact, some of these animals were positive by serum neutralization and ELISA. Epidemiological studies suggested a link between these animals and infected cattle identified in the first outbreak.

Slaughter policy

France destroyed all sheep from the UK and all susceptible species contacts (31,477 animals in total). Similar actions were taken when the outbreaks in The Netherlands and Ireland occurred. Large numbers of animals originating from the Netherlands (15,787) and Ireland (1,254 sheep) were slaughtered. Many of the sheep that had been imported were to be slaughtered anyway, because they were imported for consumption in the context of a Muslim festival.

Slaughtered animals were buried on site or carcasses were incinerated. Of note is that, at the time of the outbreaks, neither French nor EC legislation had authorized a pre-emptive slaughter policy. However, France took the initiative to conduct preventive slaughter. Approval of the Minister and professional breeders was obtained. In this regard, not only were animals associated with the Mayenne outbreak slaughtered but also swine in the protection zone defined by a model of wind spread [16] and swine sent from the zone to other departments. The action was considered highly effective in limiting spread.

Serological surveillance

Initial sampling of imported animals was conducted at the level of 10% of each batch imported (with a minimum of 30 per batch). The authorities estimated this should detect prevalence at a level of 10%. In addition, other species in contact with imported animals or nearby sheep were surveyed. Overall, France conducted serological tests of 5,048 sheep from the UK located on 172 holdings that yielded negative results; conducted serological tests with positive results on 28 samples taken from 6 holdings; and conducted tests on animals from 328 samples originating from The Netherlands on 17 holdings, all of which yielded negative results.

In both outbreaks, serological testing of holdings in surveillance and protection zones was extensive. Significant numbers of clinical investigations were also conducted.

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Import restrictions on high-risk products

Restrictions were imposed on products from susceptible species from affected Member States. These included

- holding of consignment with release only with certain guarantees,
- application of an acceptable treatment to inactivate the virus,
- return to the country of origin, and
- destruction of product.

Product was returned to the UK under a pre-existing agreement. Identification of imported product was facilitated because French officials maintained a list of establishments receiving imported material.

Measures implemented in surveillance and control zones

All farms on which animals with positive serology was detected were encompassed by a 3 km quarantine zone. All sheep were destroyed on these premises. Swine within a 3 km zone were slaughtered.

Wind dispersion was estimated by a model developed by French officials to show the spread of 10 virus particles or 1 virus particle, based on estimates of spread from swine and sheep, respectively [16]. Swine on affected farms in the 10-particle wind dispersion model area were destroyed. French officials would have slaughtered any cattle in this zone, but there were none. Cattle outside the 10-particle area were not slaughtered but left to serve as sentinel animals.

Measures implemented in the surveillance zone included the following:

- Movement and transport of livestock belonging to susceptible species was banned.
- Gatherings of all livestock species at markets, fairs, and shows were banned.
- Transport of all livestock species was banned.
- Movement of susceptible species to and from the area was banned.
- All farms holding susceptible livestock species were identified, isolated and quarantined.
- Vehicles and containers used for transportation of animal carcasses, milk, meat and other material capable of carrying virus were disinfected.
- Artificial insemination was banned.
- Procedures were implemented for disinfection of vehicle wheels and shoes of workers in establishments at risk.
- Distinct routes were defined for collection of milk from holdings located in the surveillance zone. Each dairy was assigned only one collection truck.
- Trucks carrying animals to slaughter were only allowed to travel back and forth between farm and slaughterhouse, not from farm to farm. These had to go through disinfection dips as part of the cleaning and disinfection process.

Restrictions were also imposed on products and product movements from and within affected zones or departments:

- Acceptable treatments (e.g., cooking of meat and pasteurization of milk using specified conditions) were required.
- Movement of non-treated products was restricted.
- Meat had to be identified by a special health mark.
- Certification for movement in intra-community trade was required.

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- Slaughterhouse activity ceased temporarily, and sale of meat was permitted only in the department for a period.
- Collection routes for milk and meat trucks were changed so that individual dairies and slaughterhouses were accessed solely by a single truck going back and forth between farm and dairy or slaughterhouse.
- Trucks had to be treated and disinfected.
- Meat was recalled from stores but not from consumers.
- Sale of pig meat from Mayenne was limited to Mayenne or France.

Additional measures were implemented in the control zone.

- Transport of all livestock was banned.
- Putting susceptible species to graze was banned.

Police were actively involved in movement controls into and out of surveillance zones at the local level.

The following factors contributed to the effectiveness of control measures in the affected departments.

- The field force in Mayenne was extensive. Federal employees numbered 72, including 9 veterinarians, 1 engineer, 45 technicians, and 17 administrative personnel. In addition, 100 private veterinarians were involved.
- All local veterinarians were supplied with standardized field diagnostic kits.
- When suspect cases were identified, the veterinarian remained on the premises until diagnosis was confirmed.
- Local administration, the police, and sometimes the army assisted the veterinary services. The Prefect is the chief administrative officer in a crisis. Police take samples and investigate illegal activities. Cooperation among involved units was effective.
- The results of police investigations allowed tracing of animal movements that were not evident from other records. These investigations facilitated identification of suspect and infected premises.
- The French investigative response was efficient. In one instance, a suspect premises was identified by local police tracebacks to a facility in Mayenne through which infected animals had passed. This premises had served as a staging area or rest stop for animals in transit to other locations. Animals from this facility had been moved to a premises in Seine-et Marne. As soon as the premises in Seine-et-Marne was identified, it was quarantined and the police took samples the day after suspicion was raised. Five days after the premises was identified, all animals were slaughtered. Serological test results from some of these animals were positive. However, since the animals had been killed, disease could not be confirmed by virus isolation.
- Of concern was that the premises in Mayenne that acted as a staging area associated with the affected premises had a history of active movement of animals. In the month of February 2001, a month prior to the outbreak, approximately 16,000 animals had moved through the premises.
- Disease spread from the initial suspect premises in Seine-et-Marne to a nearby premises across the road. Although nearly 2 weeks passed before disease was observed on the nearby premises, identification and confirmation of clinical disease at this premises occurred very quickly. At 2:00 pm on March 23, the owner of a nearby dairy farm observed suspicious clinical signs in cattle. The owner telephoned the veterinary services. Control zones were established at 5 pm. Laboratory confirmation of disease was provided at 11 pm the same day. Slaughter of animals began the following day. Carcasses were burned. The control zone established for both Seine-et-Marne premises was expanded to 10 km to include both affected premises.

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- A crisis team was formed that included army personnel. Roadblocks were established around the 10 km zone. Vehicles entering and leaving the zone were disinfected. Vehicles leaving the zone could only do so with authorization.

Restocking

France has established a restocking plan. The plan stipulates that, after a designated time, owners may repopulate their premises. However, the animals may not be moved off the premises and must be inspected weekly for a month. In addition, samples must be taken for serological testing.

Swill feeding

From a practical standpoint, swill feeding is not allowed because it contains animal protein. Feeding of animal protein was prohibited in November 2000 by Community legislation.

Although under consideration, implementing an official ban on swill feeding may be difficult. Some French officials expressed the opinion that control may be more effective because, if swill feeding were banned, illegal practices might simply go underground.

Compliance with measures

France has an indemnity program that includes cost of animals and production losses. This appeared to make farmers more likely to report suspects. Also, in certain cases, compensation was negotiable. At least one farmer refused to depopulate until Federal compensation was increased with local funds. In addition, farmer cooperation may be increased because sanctions are severe, both for commission and omission.

Ireland [9, 18, 19]

(Figures 2 and 3)

Sequence of events relevant to the outbreak in Ireland

February 21	The first outbreak was detected in the UK. As a result, Ireland <ul style="list-style-type: none">• instituted an immediate ban on import of susceptible animals and products from the UK.
February 23	Veterinary officials in Ireland <ul style="list-style-type: none">• initiated a process of mobilization to the border, designating 31 border crossings as checkpoints;• put new measures in place at ports and airports;• banned marts; and• extended the UK ban to horses, machinery, hay and straw, and other products.
February 28	An outbreak was reported in Meigh, Northern Ireland. The outbreak was located 2 km from the border with the Republic of Ireland. Protection and surveillance zones were established in North County Louth. The initial protection zone was extended in County Louth to account for geographical features including mountain commonage. In the zones, veterinary officials <ul style="list-style-type: none">• initiated a census; began clinical surveillance; began a precautionary cull in 4 holdings; and instituted other local responses described below;

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	<ul style="list-style-type: none"> restricted movement of susceptible species; banned breeding and artificial insemination; instituted an intensive media campaign; provided advice notes to Veterinary Surgeons and 130,000 farmers; notified Gardai;
March 2	<ul style="list-style-type: none"> moved from initial the field control center in Drogheda to the final control center in Ballymascanlan, County Louth.
March 5	<ul style="list-style-type: none"> instituted a permit system for movement of susceptible species to slaughter; revised the ban on swill feeding; confiscated personal imports of meat and milk products; instituted emergency legislation.

Sequence of events in the County Louth outbreak

March 20	A farmer reported suspicion of disease on a premises located in the extended protection zone, 9 km from Meigh. Sheep were slaughtered that day. Testing and clinical observation within zones was initiated. Since the farm was located on a peninsula, the area had some natural borders that facilitated control measures.
March 21	Samples were sent to the Institute for Animal Health, Pirbright Laboratory, England (an OIE reference laboratory) for testing.
March 22	Preliminary confirmation of disease was obtained. The control zone was extended. Restrictions on movement of susceptible species were already in place because of the outbreak in Northern Ireland. The government conducted an audit of processes and control procedures and required supplementary certification of animal products and horses. It also instituted trade restrictions on County Louth. Gardai were notified of the implications of disease.
March 23	Disease was confirmed. Cattle (113) and sheep (447) were slaughtered, clinical observations made, and samples taken. Animals from the premises were buried on site.
April 6	Cleaning and disinfection of the affected premises was completed.
April 9-11	Clinical inspections and serological tests were conducted on all herds (114 in total) within the protection zone as the cull progressed.
April 19-24	A final round of clinical visits was conducted in the controlled area prior to release of restrictions.

Comments

Level of preparation

Because of the outbreaks in the UK, France and The Netherlands, Ireland was more prepared than it might have been otherwise. The initial response plan was based on the FMD Contingency Plan already in existence and required by EC legislation. In addition, advisory groups (including expert scientists not employed by the government) participated in the development of contingency plans and epidemiological investigations.

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Traceback

Traceback was accomplished through data from the ANIMO system. Bovine, porcine and ovine imports from the UK beginning February 1, 2001, from The Netherlands beginning February 20, 2001, and from France beginning February 16, 2001, were traced. All susceptible species on holdings receiving ovines from the UK were culled. This investigation indicated that no ovines or porcines were imported from The Netherlands and France. Swine that had originated from Northern Ireland were all consigned to slaughter plants.

Traceback was facilitated by a computerized national system that has been available and was expanded in 1996 for identifying and tracing cattle. This system can trace the life and movement history of individual animals, which are identified by tags. A tracing system is also available for sheep, although it can only trace flocks at this point, not individual animals. Enhancements to the system for sheep are planned.

Slaughter policy

Slaughter was extensive. Initially, all susceptible species on holdings receiving ovines imported from the UK were culled. Subsequently, all susceptible species located within 1 km of positive parcels were slaughtered. Sheep within 3 km of positive parcels were slaughtered. Later, all sheep were slaughtered between positive parcels and the border. Finally, all sheep, wild goats, and deer on the Cooley Peninsula were slaughtered. Cattle were left as sentinel animals. All samples of domestic animals were negative. Serological results from two culled wild goats were positive.

The cull involved slaughter of wild goats and deer in a common grazing area that might serve as reservoirs of infection. The army participated in the effort. Sharpshooters and helicopters were involved. Animals were flushed out of the area by a contiguous line of hunters. Continuing visual surveillance of the area suggests that the cull was complete.

Cull figures included 47,101 Sheep; 1,008 Cattle; 2,908 pigs; 280 deer; and 166 goats. The cull was completed on April 11, 2001.

Most carcasses were destroyed by rendering at a previously inactive plant located in the area that was re-activated specifically for the outbreak. The facility handled 53,000 carcasses. Rendered material is being stored for incineration in Germany. Some carcasses (1,115) were buried on-site. A few were buried at selected off-site locations where circumstances allowed or burned in Air Curtain Furnaces.

Surveillance

Clinical evaluation was conducted on all holdings in the protection zone. Serology was conducted on all holdings with sheep and goats to detect 5% prevalence at a 95% confidence level. In the surveillance zone, clinical investigations were conducted on up to 150 sheep and goat holdings, and samples were taken for serological testing. All sheep holdings were negative.

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Serological testing in the area was also extensive.

Total Samples	12,913 (7,443 bovine and 5,470 ovine/caprine)
Cull Samples	4,400 (95/5 on randomly selected herds)
Protection Zone	795 (13-17 per herd in protection zone [bovines])
Surveillance Zone	7,062 (5,783 cattle; 1,273 sheep, 6 goats)
Others (suspect cases, etc.)	656

A national program has been instituted to demonstrate freedom from FMD. It is separated into two phases. In the first, flocks in high risk areas are surveyed to a level that will detect at least one infected animal with 95% confidence, assuming 5% seroconversion within flocks. In the second phase, the focus will be on lower risk areas in the remainder of the country.

Measures implemented in zones and at national borders

Federal activities were coordinated from the National Disease Control Center in Dublin. Cooperation among various units was extensive. Public sector resources included the Gardai, local authorities, the Army, Duchas. Private sector contributions included the hotel facilities in which the Local Disease Control Center (LDCC) was housed.

The LDCC was operational between February 28 and May 2. The center was operated ultimately from a hotel in the area that provided meeting facilities as well as room and board for center personnel. The hotel center became operational March 2. Local control officials coordinated surveillance and control activities closely with officials in Northern Ireland.

Animal movements between Ireland and Northern Ireland and within Ireland were strictly controlled. Animals could not be moved into Ireland from Northern Ireland. Roads were closed and checkpoints established at 141 locations between Ireland and Northern Ireland. These checkpoints were supervised 24 hours per day, 7 days per week by both police and veterinary officials. All vehicles were stopped and disinfected.

Controls were enhanced at ports, airports and border crossings. Passengers were provided information by various routes including notices, posters, broadcasts, handouts, or announcements made on passenger craft. Vehicles from affected areas and passenger footwear were disinfected. Prohibited products were confiscated. Personnel participating in these efforts included the Department of Agriculture, Food, and Rural Development (DAFRD), Gardai (Irish police), Customs and Excise personnel, other government personnel, Army personnel, Civil Defense workers, and Farm Relief staff.

In County Louth, animals were not allowed to move into or out of the zone. Movement within the zone was permitted only under license. Movement out of the region was allowed for slaughter only. Products were only allowed to move under license.

Special procedures were instituted for collection, processing, and distribution of milk. Milk from the control zone had to be treated so as to inactivate FMD virus.

Personnel returning from field activities were coordinated from and underwent cleaning and disinfection at a local sports club that was renovated for this purpose. The club was located on a major access road carrying traffic to and from the affected peninsula. Daily activities were planned and work assignments were coordinated from that location. Samples were returned from the field to that location. Standard operating procedures for field activities and personal disinfection were implemented. Vehicles were also inspected and disinfected at this station.

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Restocking policy

A restocking policy has been established for the Cooley area of County Louth. Written guidelines are available. Species are reintroduced at different dates depending on the level of risk associated with the species. In this regard, permission will be granted to restock the riskiest species (sheep) last.

Swill feeding

Ireland has implemented legislation that supplements the EC legislation on swill feeding. Irish regulations on swill feeding have been in place since 1985 [20, 21]. In addition, there is a enhanced ban on swill to include "any product derived in whole or part from any carcass or offal" until December 2001 [22] .

Compliance with measures

Authorities in the Republic of Ireland reported that compliance and cooperation with the measures enacted was excellent.

Release Assessment: Summary and approach to evaluation of risk factors

In its initial evaluation, APHIS identified the occurrence of an outbreak as the major risk factor associated with animals and products exported to the United States. Therefore, eradication of disease should mitigate that risk.

Duration of restrictions

In its initial analysis, APHIS noted that occurrences of disease in Northern Ireland and The Netherlands were separated by a disease-free period that approximated the length of time specified by EC legislation for maintenance of control zones (i.e., 30 days). APHIS expressed the concern that disease might occur after restrictions were lifted and animals and products had begun to move in commerce.

The issue was not identified previously as a specific concern for the assessment of France and Ireland. In the first place, there were no instances of disease occurrences in these Member States for which confirmation was separated by a period as long as 30 days. In this regard, a 10-day period (March 13 to March 23 in France) was the longest period of time separating confirmation of disease, and the pathway was traced. In addition, the number of occurrences in both Member States was extremely low (two in France and one in Ireland).

Subsequently, a longer disease-free period, one that was at least consistent with OIE criteria, was maintained in both Member States. Specifically, the last case in France occurred on March 23, 2001, and the last case in Ireland occurred on March 22, 2001, 3 months prior to the site visit by APHIS personnel.

Spatial aspects of outbreaks

In the initial assessment, APHIS noted that outbreaks in The Netherlands occurred outside restriction zones approximately 100 km from affected areas. Outbreaks outside restriction areas were also observed in Northern Ireland and France. The origin of the distant outbreaks in The Netherlands was not identified to APHIS. APHIS expressed the concern that unexplained long-distance movement of disease could contribute significantly to risk.

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In the absence of any other explanation, APHIS attributed the unexplained long-distance spread to an increased risk of FMD transmission while virus availability remains high. Eradication of the disease in France and Ireland mitigates this concern.

Conceivably, however, disease could still spread from the UK. Recent reports suggest that the prevalence of outbreaks in the UK is significantly reduced since its peak, more than 40 per day, to approximately 2 per day [23]. In addition, recent disease outbreaks have been localized to the UK with no documented spread to other Member States. These observations suggest that availability of the virus is reduced significantly in the region as a whole and spread from the UK to other Member States is under control.

Risk Factors applicable to France and Ireland

APHIS could identify no additional risk factors applicable to either France or Ireland. APHIS initially considered regionalizing within the Member States and only recognizing those regions that had remained FMD-free during the outbreaks. However, since eradication, control, and surveillance mechanisms appeared to be effective, APHIS assigned a single risk category to the entire Member State.

APHIS cites the following factors as relevant to the situation in France:

- French veterinary officials took quick action.
- Pre-emptive slaughter, which was not part of the legislative framework, was initiated.
- After diagnosis in two departments, local control mechanisms kept disease contained within small control zones in each of two departments.
- Epidemiological tracing of disease was effective.
- Cooperation among relevant participants (e.g., Federal veterinary officials, local veterinary officials, police, army, and the public) was effective.
- There were only two occurrences.
- Surveillance activities continued after disease eradication.
- Restocking of affected premises is controlled.
- Swill feeding is effectively banned by EC legislation.
- French veterinary authorities maintained active lines of communication with US counterparts.

APHIS cites the following factors as applicable to the situation in Ireland.

- Irish officials took quick action.
- Pre-emptive slaughter and culling of susceptible species (including wildlife) on the Cooley Peninsula was effective.
- Local control mechanisms kept disease contained within a zone.
- Epidemiological tracing of disease was effective.
- Cooperation among relevant participants (e.g., Federal veterinary officials, local veterinary officials, Gardai, army, public) was effective.
- There was only one occurrence of disease.
- Surveillance activities continued after disease eradication.
- Restocking of affected area is controlled.
- Swill feeding is banned by EC and national legislation.
- Irish veterinary authorities maintained active lines of communication with US counterparts.

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Risk Rating

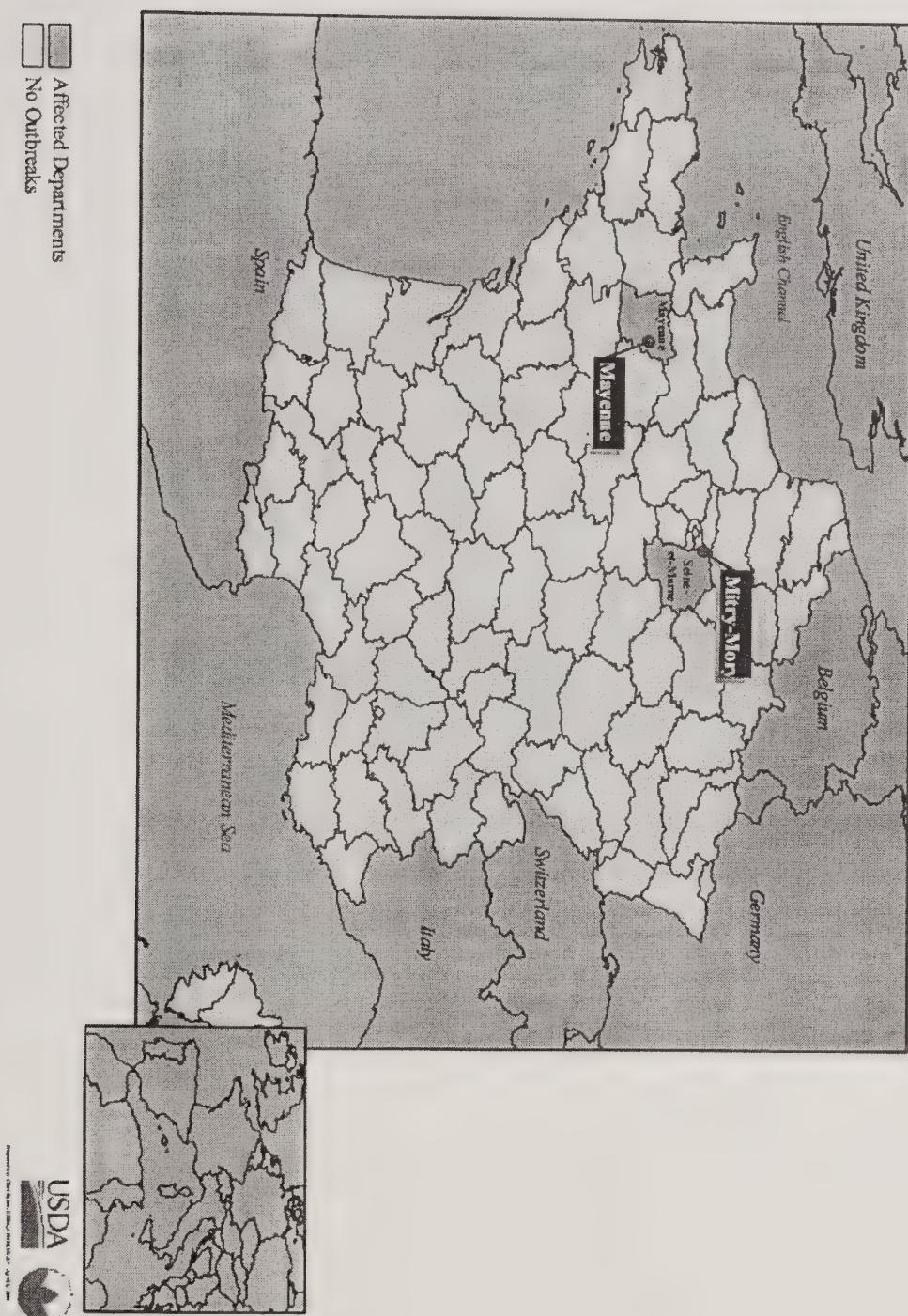
A team of staff officers from APHIS, Veterinary Services, evaluated the risk and developed a consensus opinion on the relative risk for France and Ireland in the same context as described in the risk assessment for the thirteen EU Member States. In the absence of specific criteria to assign risk levels, risk categories applied were "lower" and "higher." Because of the outbreaks, the "higher" risk category had been assigned to France and Ireland in the previous assessment. In this re-evaluation, France and Ireland were reassigned to the "lower" risk category.

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France FMD Outbreak

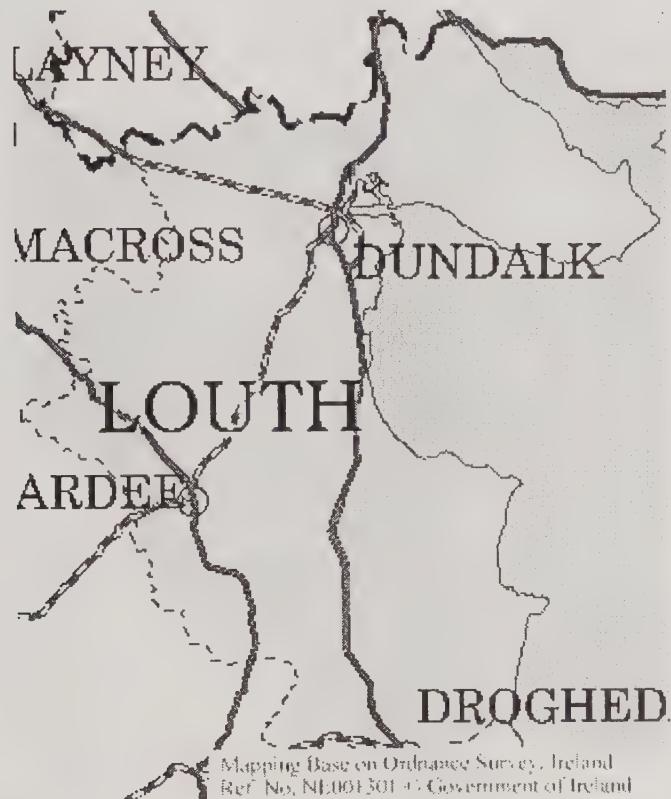
as of March 29, 2001

2 Confirmed Outbreaks



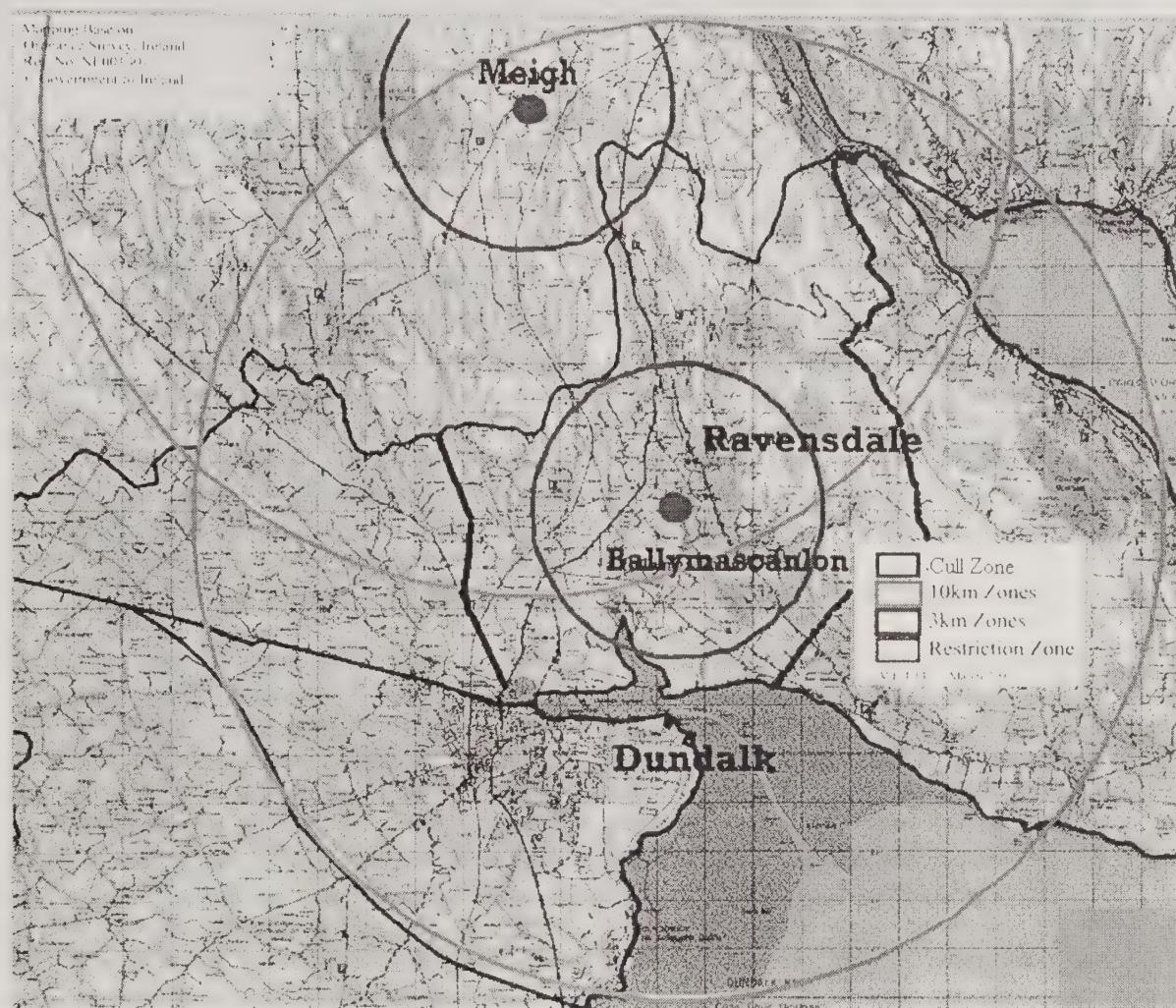
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Figure 2: County Louth, Ireland (from <http://www.irlgov.ie/daff/AreasofI/FMD/louth1.htm>)



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Figure 3: Zones established in County Louth, Ireland (from <http://www.irlgov.ie/daff/AreasofI/FMD/detail.htm>)



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